

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Previously Presented): A silicon nitride wear resistant member comprised of a ceramic sintered body comprising

55 to 75 mass% of silicon nitride,

12 to 28 mass% of silicon carbide,

3 to 15 mass% of at least one element selected from the group consisting of Mo, W, Ta, and Nb in terms of silicide thereof, and

5 to 15 mass% of grain boundary phase comprised of a rare earth element-Si-Al-O-N,

wherein the wear resistant member has an electrical resistance of 10^7 to $10^4 \Omega \cdot \text{cm}$,

a porosity of 1% or less, and

a three point bending strength of 900 MPa or more.

Claim 2 (Previously Presented): The silicon nitride wear resistant member according to Claim 1, wherein the wear resistant member has a fracture toughness of $6.0 \text{ MPa} \cdot \text{m}^{1/2}$ or more.

Claim 3 (Previously Presented): The silicon nitride type wear resistant member according to Claim 1, wherein the wear resistant member further comprises

5 mass% or less of at least one element selected from the group consisting of Ti, Hf, and Zr in terms of the oxide thereof.

Claim 4 (Previously Presented): The silicon nitride wear resistant member according to Claim 1, wherein a rolling life, defined as a rotation number of steel balls rolling along a

circular track formed on the wear resistant member formed of the silicon nitride sintered body until a surface of the silicon nitride wear resistant member peels off is 1×10^7 or more,

wherein the rolling life is measured by

setting a circular track having a diameter of 40 mm is set on the upper surface of the plate-shaped wear resistant member,

providing the three rolling steel balls each having a diameter of 9.525 mm and comprised of SUJ2 on the circular track, thereby forming a thrust type bearing testing machine, and

rotating the rolling steel balls on the track at a rotation speed of 1200 rpm while applying a load of 3.92 KN.

Claim 5 (Previously Presented): The silicon nitride wear resistant member according to Claim 1, wherein the silicon nitride sintered body has a crush strength of 200 MPa or more, and a rolling fatigue life defined as a time until a surface of rolling balls comprised of the silicon nitride wear resistant member rolling along a circular track on a steel plate peels off, is 400 hours or more,

wherein the rolling fatigue life is measured by forming three rolling balls each having a diameter of 9.525 mm from the silicon nitride wear resistant member,

providing the three rolling balls on the circular track having a diameter of 40 mm set on the upper surface of a steel plate formed of SUJ2, thereby forming a thrust type bearing testing machine, and

rotating the rolling ball at a rotation speed of 1200 rpm on the track while applying a load to impact a maximum contact stress of 5.9 GPa to the balls.

Claim 6 (Withdrawn): The method of manufacturing a wear resistance member comprised of a silicon nitride sintered body, the method comprising:

preparing a material mixture by adding

12 to 28 mass% of silicon nitride,

3 to 15 mass% of at least one compound selected from the group consisting of the carbides, the silicides, and the oxides of Mo, W, Ta, and Nb in terms of the silicide thereof,

2 to 10 mass% of a rare earth element in terms of the oxide thereof,

2 to 10 mass% of aluminum in terms of the oxide thereof, and

5 mass% or less of at least one element selected from the group consisting of Ti, Hf, and Zr in terms of oxide thereof

to silicon nitride powder comprising 1.7 mass% or less of oxygen and 90 mass% or more of α phase type silicon nitride, and having an average grain size of 0.1 μm or less;

molding the material mixture to form a compact;

degreasing the compact; and

sintering the compact in a non-oxidizing atmosphere at a temperature of 1850°C or lower.

Claim 7 (Withdrawn): The method of manufacturing a silicon nitride wear resistant member according to Claim 6, wherein the method further comprises:

conducting a hot isostatic pressing treatment (HIP) in a non-oxidizing atmosphere of 30 MPa or more at a temperature of 1800°C or lower after said sintering.

Claim 8 (New): The silicon nitride wear resistant member according to Claim 1, wherein the porosity of the ceramic sintered body is 0.5% or less.

Claim 9 (New): The silicon nitride wear resistant member according to Claim 1, wherein the porosity of the ceramic sintered body is 0.2% or less.

Claim 10 (New): The silicon nitride wear resistant member according to Claim 1, wherein the porosity of the ceramic sintered body is 0.01% or less.

Claim 11 (New): The silicon nitride wear resistant member according to Claim 1, wherein the at least one element comprises Mo.

Claim 12 (New): The silicon nitride wear resistant member according to Claim 1, comprising

60 to 70 mass% of silicon nitride,

15 to 25 mass% of silicon carbide,

5 to 13 mass% of said at least one element in terms of silicide thereof, and

7 to 13 mass% of said grain boundary phase.

Claim 13 (New): The method of manufacturing a silicon nitride wear resistant member according to Claim 1, the method comprising:

preparing a material mixture by adding

12 to 28 mass% of silicon nitride,

3 to 15 mass% of at least one compound selected from the group consisting of the carbides, the silicides, and the oxides of Mo, W, Ta, and Nb in terms of the silicide thereof,

2 to 10 mass% of a rare earth element in terms of the oxide thereof,

2 to 10 mass% of aluminum in terms of the oxide thereof, and

5 mass% or less of at least one element selected from the group consisting of Ti, Hf, and Zr in terms of oxide thereof

to silicon nitride powder comprising 1.7 mass% or less of oxygen and 90 mass% or more of α phase type silicon nitride, and having an average grain size of 0.1 μm or less;

molding the material mixture to form a compact;

degreasing the compact; and

sintering the compact in a non-oxidizing atmosphere at a temperature of 1850°C or lower.

Claim 14 (New): The method of manufacturing a silicon nitride wear resistant member according to Claim 13, wherein the method further comprises:

conducting a hot isostatic pressing treatment (HIP) in a non-oxidizing atmosphere of 30 MPa or more at a temperature of 1800°C or lower after said sintering.

DISCUSSION OF THE AMENDMENT

New Claims 8-14 have been added. Claim 8 is supported in the specification at page 15, line 12. Claim 9 is supported in the specification at page 31, Table 3, Example 9, combined with other Examples having a lower porosity. Claim 10 is supported in the specification at, for example, page 25, Table 1, Example 1, and at page 31, Table 3, Examples 2-8 and 10-20. Claim 11 is supported in the specification at page 11, lines 21-22. Claim 12 is supported in the specification at page 10, lines 1 and 19; page 11, line 13; and page 12, lines 21-22. Finally, Claims 13 and 14 are analogous to Claims 6 and 7, respectively, but depend or ultimately depend on Claim 1.

No new matter is believed to have been added by the above amendment. Claims 1-14 are now pending in the application. Claims 6 and 7 stand withdrawn from consideration as drawn to a non-elected invention. Claims 13 and 14 would appear to be rejoinable.